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DEFORESTATION AND LAND DEGRADATION IN CENTRAL ZONE OF
INDIA : A STUDY ON ECOLOGY

By

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1.0 Introduction : Central Zone of India comprises Uttar Pradesh and Madhya Pradesh, which is located between Long. 74° E to 85° E and Lat. 17° N to 31° N and it occupies an area of 737857 Sq. Km. whereas the total population of the zone is 163040857, in which U.P.'s share is two-thirds. The population density per Sq.Km. in U.P. is 377 and in M.P. it is 118. In central zone the proportion of urban population is 18.7 per cent when the proportion of urban area is 1.28 per cent. In U.P. the urban population is 17.9 per cent and M.P. it is 20.3 per cent, which cover the urban area of 1.55 and 1.10 per cent respectively. Mostly it is observed that the urban areas are expanding on agricultural lands. In U.P. and M.P. according to revenue information about 17.20 and 32.16 per cent areas are under forest, whereas according to NRSA maps, the forest proportions are 7.14 and 20.45 per cent respectively. Similarly the proportion of culturable wasteland in U.P. is 1.13 per cent and in M.P. 4.87 per cent, when NRSA maps show this 9.73 and 5.69 per cent respectively. This statistical discrepancy needs our special attention.

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Plants first appeared on earth, the animals ~~came~~ later. Plants provided food and shelter to all terrestrial animals. The Rig Veda (X-97-4) describes the plants as "The devine mother of mankind". In pre-historic times, man had knowledge about good quality wood and proper utilisation of wood. The wood samples found from the excavation of Mohenjodaro and Harapa in Indus valley and the coffins from the tombs of the Pharoahs in Egypt, bear testimony to this.¹

Among the ancient accounts of Indian forests and their management the one given in the Arthasastra of Kautilya is perhaps, the most outstanding vivid account during Mauryan imperialism in Northern India. Forests were considered State property or the personal property of the King. People, of course, were, free to use the forest products without destroying them and the wild animals were protected.²

During the medieval period, roughly between 1000-1700 A.D. the marked influence of Central Asia and in later period of Moghul rule, the forests were directly under human influence. Construction of roads, forts and emergence of towns, mainly depended on deforestation. However, there are examples of afforestation, specially in open spaces land along the road sides, by better species. During Akbar's reign the population of India was estimated to be around 5 crores, which had required more agricultural land by deforestation.

Beginning of British era saw the fast exploitation of forest wood to meet the requirements of esteemed powered transport i.e., ships and railways, which ultimately helped to transport the remote and far distant wood. Good quality of

Teak-wood was first exploited by the East India Company to meet the requirements of their palacial bungalows and trade. Of course there are examples of scientific management of forests by British Government, on which, our present day forest management system functions.

India attained independence (1947) and poor management, at a time, when forests needed careful tending to recover from the shocks of world war II, fellings in many good areas, could not regenerate, lost productivity and became degraded in course of time. To a great extent, it already had an adverse influence on other vital areas of national importance, such as hydrology and water shed management, soil conservation and the like. Though much has been done, but if an impartial evaluation is made of the efforts made and results obtained, the over-all picture would be a dismal one. The vast majority of the people living in rural areas depend on forest products for their energy and all other needs. Farm Forestry as a scheme of afforestation continued for quite some time under the Five Year Plans, but did not yield much result in many states. Within the last three decades 4.4 million hectares forest land has been deforested for other type of land use. Study made by F.A.O. & IUFRO (International Union of Forestry Research Organisation) reveals that the deforestation in the tropical belt is going at the rate of 1.1 to 1.2 per cent per annum.³ For a thickly populated country like India the deforestation rate may stand at 1.5 per cent. This means that about one million hectare of productive forest is destroyed every year due to misuse. While this is the position of our forests, about 80 per cent of our population lives in villages which depends on agriculture. Fast

shrinking forest cover endangered our eco-system, which is frequently reflected through drought, flood and ultimately vast fields are left as waste lands.

"Among the ecological factors, forest canopy helps in maintaining constantly humid conditions at ground level making soil humus rich and mull humus, which has a high water holding capacity. In such circumstances stream flow is relatively even; water is released gradually from the humus layers, infiltration is promoted, and the movement of water above or below ground is retarded by obstruction, so reducing rapid flow and lowering flood crests whilst in low-water periods flow is prolonged. Furthermore, under these conditions the streams are clear and there is little eroded material in suspension".⁴

"Many of our present land use problems are directly referable to the ecological changes brought about by the deforestation of our landscape. Having removed the productive cover of the forest, we are now faced with problems of exposure to wind and storm, desiccation in dry seasons and such factors as frost action in winter".⁵

2.0 Distribution of Forest : The remote sensing map of central zone (1980-82) consisting U.P. and M.P. shows that the area under forest covers in U.P. and M.P. are only 7.14 and 20.45 per cent respectively. The forest cover includes open and closed forests. In U.P. the open and closed forests are 0.97 and 6.17 per cent respectively, whereas in M.P. these are 4.84 and 15.61 per cent respectively. The same area under forest calculated at the district level, reveals that in U.P. 32 districts have no forest cover, which are mostly along the

river Ganges. In M.P. 5 districts have no forest cover, which are in the western and northern parts of the State. In U.P., the main forest covered districts are in the Kumaun-Garhwal region and also Mirzapur in the eastern region. Little forest covers are in the tarai districts, Bundelkhand and eastern region. In M.P. the Central, Southern and Western districts have significant forest cover (See Table-1). Districts of central zone can be placed into four following categories of forests:

- (i) Large Forest Covers : In U.P., Almora, Pauri and Nainital (Above 30 per cent) districts fall where 49.66, 38.65 and 34.5 per cent areas are covered under forest respectively. In M.P., there are 7 districts in this category like Balaghat 45.18, Bastar 44.15, Raisen 44.11, Surguja 41.47, Rajnandgaon 40.03, Sidhi 31.95 and Mandla 30.07 per cent.
- (ii) Medium Forest Covers : In this category four districts of (20-30 per cent) U.P. namely Dehradun, Tehri, Mirzapur and Chamoli fall where forest covered areas are 27.30, 25.92, 21.75 and 21.25 per cent respectively. In M.P., there are 7 districts, Raipur 28.18, Bilaspur 27.29, Shahdol 25.80, Panna 24.74, Hoshangabad 23.71, East Nimar 23.20 and Chhindwara 22.73 per cent.
- (iii) Low Forest Covers : U.P.'s low forest covers are found in (10-20 per cent) districts of Uttarkashi 19.02, Pithoragarh 18.79, Pilibhit 11.89 and Khiri 11.13 per cent. In M.P. these are Seoni 19.97, Raigarh 19.78, Betul 19.73, Jabalpur 17.37, Damoh 16.83, Narsimhapur 15.76, Dewas 15.03, Satna 14.33, Guna 13.31, Shivpuri 11.57, Chhatarpur 11.40 per cent.
- (iv) Scanty Forest Covers : In U.P. these districts are Sahanpur 8.41, Lalitpur 7.97, Bijnor 7.44, Baharich 7.16, Varanasi 6.22, Gonda 5.51, Gorakhpur 3.56, Banda 3.54, Shahjahanpur 1.53,

Rampur 1.06, Allahabad 0.72, Hamirpur 0.43 and Ghazipur 0.35 per cent. Whereas in M.P. the districts are Sagar 8.99, Sehore 8.16, West Nimar 8.12, Morena 8.11, Rajgarh 7.97, Durg 6.79, Vidisha 6.77, Jhabua 6.35, Indore 6.15, Bhopal 5.66, Rewa 5.26, Tikamgarh 2.79, Gwalior 1.11, Mandsoar 0.94 and Dhar 0.64 per cent.

3.0 Trend of Deforestation : Remote Sensing Organisation has provided two forest maps of 1972-75 and 1980-82, which shows that in this period U.P. has lost 1.65 per cent forest cover. The state has lost 2.05 per cent closed forest cover and increased the open forest cover by 0.40 per cent. In M.P., the deforestation had been comparatively fast as it is 4.06 per cent. The closed forests reduced by 4.42 per cent, whereas the open forests increased by 0.35 per cent.

Actually during 1972-75 and 1980-82 period 485705 Hect. forests in U.P. and 1805296 Hect. forests in M.P. were cut which were mainly closed forests. This was the absolute destruction of forests besides a large proportion of closed forests were converted into open forest.

The following table shows that deforestation is more in those regions where forest cover is more. There is only one exception in Central region of U.P., where forest cover has increased by 0.23 per cent due to mainly eucalyptus effect, otherwise in each region of Central Zone of India forest cover has been reduced. The maximum forest destruction took place on fragile Central Himalaya i.e., Hill region of U.P., where about 8.56 per cent forest covers was reduced. In Bundelkhand forest destruction is least i.e., 0.04 per cent, which may be

because of inaccessibility and comparatively lesser population pressure. In Western region of U.P. where forest cover is already less than 2 per cent due to intensive agriculture (About 80 per cent of land is under cultivation), about 0.22 per cent forest cover is lost, which is ecologically hazardous. Eastern region, which is specially water logged and flood prone, has only less than 5 per cent forest cover and that also is being lost by 0.31 per cent.

Madhya Pradesh, which was supposed to have a big forest reserve to compensate the forest needs of the country specially in terms of ecology is now (1980-82) found to be much below the requirement with only 20.45 per cent forest cover. During 1972-75 to 1980-82, the M.P.'s forest cover has been lost by 4.06 per cent and 0.35 per cent closed forests became open forest. In northern plains and plateaus region, where ravines are predominant, forests have gone down from 10.02 per cent (1972-75) to 7.02 per cent (1980-82). Here the land dominant of calcareous soil has been transformed into the ravinous land mainly due to heavy deforestation. The eastern hills and Chattisgarh-region is dominantly tribal, where people solely depend on forest produce, even then 2.40 per cent forest cover was removed and 0.73 per cent closed forest was damaged into open forest. The entire M.P.'s main land consisting three regions i.e., Central plateau and hills, Vindhayan hills and plateau land Malwa plateau, have experienced more than 5 per cent deforestation which is mainly due to industrialization in this region. Since M.P. falls under insufficient rainfall state, the further deforestation would be hazardous.

4.0 Trends of Revenue Statistics of Forest : However, the trend of area under forest in U.P. according to revenue statistics shows an increase from 3.2 million hectares in 1950-51 to 5.1 million hectares in 1973-74. In fact this statistics takes into account all those areas which are under Forest Department and does not consider the actual coverage of forest. Also the increase in area under forest is due to Zamindari abolition during 50s, when the surplus lands with or without trees were given to the Forest Department. After 1973-74 to 1985-86 the area under forest remained almost constant and no significant change took place. In M.P., area under forest of Forest Department had constantly declined from 172460 Sq.Km. in 1956-57 to 155414 in 1979-80, which the same continued till 1985-86. There is a decline of 17046 Sq.Km. forest area during 23 years i.e., 1956-57 to 1979-80, perhaps due to vast urbanization. However this statistics does not give any idea of real forest cover in M.P.

5.0 Distribution of Wasteland : There are two types of wasteland i.e., culturable and non-culturable. In most of the cases culturable wastelands are the result of adverse eco-system which is our own creation, by mismanaging the forest and land resources. According to our calculation from NRSA map of wasteland 1980-82 about 14.45 per cent land of U.P. is wasteland in which 9.73 per cent land is culturable wasteland and 4.72 per cent land is unculturable wasteland (Table-2). In case of Bundelkhand and Hill region of U.P., the wastelands are almost double than the State average. About 28.53 per cent land is wasteland in Bundelkhand, out of which 26.21 per cent land is culturable wasteland and 2.32 per cent land is unculturable wasteland. Whereas in Hill region about 26.05 per cent land is wasteland out of which

only 0.69 per cent land is culturable wasteland otherwise largely i.e., 25.36 per cent land is unculturable wasteland. In 3 Plain regions of U.P. about one-tenth land is culturable wasteland and a negligible land is unculturable land. In U.P., out of 9.7 per cent culturable wasteland about 7.82 per cent land is affected by gullies ravines and salinity, and rest 1.91 per cent land is affected due to land undulation, water logging, sand and forest blanks. In only Western region, where about 1.49 per cent land is affected by sand due to desert encroachment from borders of Rajasthan through Mathura and Agra. About 4.40 per cent land is covered by snow and 0.32 per cent land is rocky which together is 4.72 per cent unculturable wasteland, otherwise the entire culturable wasteland can be well utilized in the most populous state where the land is most scarce resource.

In M.P. about 6.36 per cent land is wasteland in which about 5.69 per cent land is culturable wasteland and rest 0.67 per cent land is unculturable wasteland. In any case unculturable wasteland does not exceed 1.4 per cent in any region of M.P. In two regions, culturable wasteland is comparatively high as in Northern Plains land Plateaus 9.92 per cent and Malwa Plateau 8.07 per cent. In M.P. the NRSA map of wasteland does not show any salt affect or water logged land, but however recently this has occurred in Hoshangabad districts due to faulty canal irrigation system, as revealed by our field survey. There are very negligible patches of sand in only Malwa plateau on 0.08 per cent area, which is due to neighbourhood of Rajasthan, as stated in case of U.P. Due to deteriorating condition of forests, most of the river banks and large chunk of side lands are affected due to gullies or ravines. In Northern Plains and

Plateaus region the proportion of eroded land is 8.57 per cent, whereas in Central Plateau and Hills region and Malwa Plateau region this proportion is about 4.40 and 4.68 per cent respectively.

6.0 Ecological Consideration : Government policy of reclamation of wasteland mainly for agriculture, seems to be impractical and harmful to the entire eco-system. Our field experiences reveal that in most of the cases the reclaimed land could not sustain long for agricultural practices and finally farmers had to abandon the land. However the government's National Forest Policy to retain atleast the one-third land under forest cover had seriously been violated by illegal deforestation. The reality emerged that in actual sense Forest Department does have land but not actual forest cover which indeed needed most. Quite recently it is widely uploded that due to deforestation the eco-system has seriously been affected and it is dangerously causing flood, drought and overall soil infertility. For example in U.P., during 1975 monsoon about 12 districts mainly along the course of river Ganges were affected by flood and similarly in M.P. about 7 districts were submerged. Due to lack of normal rainfall in 1986 about 16 districts in U.P. were affected by drought whereas in M.P. about 6 districts were in it's grip.⁶ By another U.P. Government estimate in 1985, about 3976000 hectares of land was affected by flood and 3515598 hectares in 1984 was affected by drought. Thus the loss estimated by flood and drought was about Rs.121572.80 and Rs.29013.04 lakhs respectively.⁷

Since in U.P. the actual forest cover is much more below the required, therefore the entire culturable wasteland must

be brought under forest cover instead of agriculture. Even then the aims of National Forest Policy would not be fulfilled, therefore the grazing lands and old fallows may also be considered for afforestation. As the controlled grazing in the forests would be purposeful instead of haphazard grazing in open areas, where even blade of grass does not grow.

In M.P. the situation is not as serious as in U.P., but even then the culturable wasteland if afforested does not fully meet the National Forest Policy goals. Since M.P. is deficient in rainfall, and keeping in view the overall ecological balance in national interest, we must cover as much area as possible under forest cover instead of large chunk of land is left as grazing land, old fallow and so on.⁸

Social Forestry must take up all the rail, road, canal and community lands and even the private lands by persuasion for full vegetative covers to meet the ecological and fuel needs. As the food fuel and overall ecology are the essential needs of the time, which must not be sacrificed on others cost, instead they must be interlinked as they had been.

7.0 Conclusion : It is clear that without forests a balanced ecology is not possible. Their function is to retain fertility by controlling the soil erosion, keeping checks on spread of wasteland, soil moisture, keeping perennality in surface and sub-soil waters and normalization of temperature during harsh summers. Besides the eco-system, forests are the direct source of fuel, fodder, timber and medicines for millions of people. Therefore it won't be wise to continue deforestation and divert the waste lands to agriculture, instead of afforesting it for

overall benefits. It is also essential to have correct information about effective forest coverage, wasteland and soil fertility, because the revenue information does not tally with the actual field scenario.

Table 1 : Trends of Deforestation

(Percentage to Total Geographical Area)

State/Region	Closed Forest Area		Open Forest Area		Total Forest Area	
	1972-75	1980-82 Difference	1972-75	1980-82 Difference	1972-75	1980-82 Difference
A. UTTAR PRADESH	8.22	6.17 -2.05	0.57	0.97 +0.40	8.79	7.14 -1.65
1. W. Region	1.79	1.59 -0.20	0.06	0.04 -0.02	1.85	1.63 -0.22
2. C. Region	1.49	1.58 +0.09	0.14	0.29 +0.15	1.63	1.86 +0.23
3. E. Region	4.42	3.19 -1.23	0.42	1.34 -0.08	4.84	4.53 -0.31
4. Hill Region	34.29	25.11 -9.18	2.11	2.73 -0.62	36.40	27.84 -8.56
5. Bundelkhand	2.52	1.92 -0.60	0.42	0.47 +0.05	2.43	2.39 -0.04
B. MADHYA PRADESH	20.03	15.61 -4.42	4.49	4.84 +0.35	24.51	20.45 -4.06
6. Eastern Hill & Chattisgarh	30.80	27.67 -3.13	5.26	5.99 +0.73	36.06	33.66 -2.40
7. N. Plains & Plateaus	9.14	5.30 -3.84	0.88	1.72 +0.84	10.02	7.02 -3.00
8. C. Plateau & Hills	15.20	9.22 -5.98	5.62	6.31 +0.69	20.82	15.53 -5.29
9. Vindhayan & Hills & Plateau	23.55	17.91 -5.64	3.91	4.14 +0.23	27.46	22.05 -5.41
10. Malwa Plateau	8.28	3.73 -4.55	4.29	3.36 -0.93	12.57	7.09 -5.48

Source : Based upon our calculations from district level NRSA maps of U.P. & M.P. for 1972-75 and 1980-82.

Table 2 : Wasteland

(Percentage to total geographical area)

State/Region	Culturable							Non-culturable			
	Salt affected	Gullied or Ravinous land	Water logged or Marshy	Undulating up-land with or without shrub	Jhum or forest blank	Sandy area	Total	Barren hill ridge or outcrop	Snow covered or glacial area	Total	Total waste-lands
A. Uttar Pradesh	3.89	3.93	0.52	0.61	0.36	0.42	9.73	0.32	4.40	4.72	14.45
1. W. Region	3.99	3.67	-	-	2.25	1.49	9.40	-	-	-	9.40
2. C. Region	5.68	2.45	1.08	-	1.13	-	10.33	-	-	-	10.33
3. E. Region	6.49	3.24	1.21	1.53	-	-	9.48	0.31	-	0.31	9.79
4. Hill Region	-	-	-	-	0.69	-	0.69	-	25.36	25.36	26.05
5. Bundelkhand	-	24.54	-	1.67	-	-	26.21	2.32	-	2.32	28.53
B. Madhya Pradesh	-	2.79	-	2.24	0.65	0.02	5.69	0.67	-	0.67	6.36
6. E. Hill & Chattisgarh	-	0.14	-	2.69	1.01	-	3.84	0.09	-	0.09	3.93
7. N. Plains & Plateaus	-	8.57	-	1.30	0.05	-	9.92	1.20	-	1.20	11.13
8. C. Plateau & Hills	-	4.40	-	0.79	0.73	-	6.00	1.38	-	1.38	7.38
9. Vindhayan Hills Plateau	-	0.35	-	2.46	0.84	-	3.64	0.62	-	0.62	4.26
10. Malwa Plateau	-	4.68	-	3.32	0.07	0.08	8.07	0.70	-	0.70	8.76

Source : Based upon our calculation from district level NRSA maps of U.P. & M.P. for 1980-82.

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